

## Notes on Occupational Classification

### Notes sur la classification occupationnelle

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#### Résumé de l'article

Le but de ces « Notes » est de tracer le développement de la réalité de la main-d'œuvre ainsi que cette description « interprétative » — classification occupationnelle — en examinant les grandes lignes de l'histoire du recensement au Canada.

Pendant les trois cents années de recensement il y a eu des tentatives de recueillir des données sous une forme significative commençant avec la « classification occupationnelle française » et avec les classifications anglaises selon l'origine nationale. Pourtant en 1827 les recenseurs se sont rendus compte qu'une distinction utile pouvait être faite entre les classifications industrielles et occupationnelles, mais au tout début du siècle présent l'accent a été placé de sorte qu'on a abouti à l'isomorphisme total des deux classifications. Ceci a conduit à une diminution du pouvoir descriptif parce que les recenseurs ne se sont pas bien rendus compte que leur main-d'œuvre actuelle présentait deux aspects différents. Malgré l'introduction de nouveaux principes de classification dans le recensement de 1921 et 1931 la réalité grandissante de la main-d'œuvre, ces nouvelles caractéristiques aux dimensions n'étaient pas saisies d'une façon adéquate par la structure de la classification occupationnelle. L'introduction de la « Classification Internationale Type des Professions » qui était basée sur le concept de la « nature du travail effectué » entre 1951 et 1961 donnait un autre critère pour définir un aspect de la réalité de la main-d'œuvre. Seulement elle a conduit à une série de classifications — occupationnelles, industrielles et selon les habiletés — qui étaient largement indépendantes et ne pouvaient être traduites.

Ainsi jusqu'à ce jour il y a eu des tentatives pour développer une structure qui rendrait le recensement apte à des usages descriptifs aussi bien qu'à l'analyse et les projections, mais l'accent sur l'aspect descriptif a graduellement diminué.

Comme la politique économique a été plus coordonnée avec la politique sociale durant les années récentes il y a une nécessité croissante d'ajuster les classifications anciennes aux conditions nouvelles. La structure des classifications futures devra être reliée à l'éventail des politiques possibles de sorte que les variables économiques requises répondront aux exigences. Il est également important de considérer les complémentarités des « inputs » du travail et du capital. Peut-être un indice de « recyclage » sur le temps » (on-the-job-retrainability) est utilisé en combinaison avec l'approche de Parnes consistant à définir « le travail effectué » en classifiant les travailleurs en des catégories qui suggèrent le « contenu d'habiletés » et plus appropriées pour une mesure des caractéristiques importantes de la main-d'œuvre.

# Notes on Occupational Classification \*

Glen Alexandrin

*In the first part of this article, the author shall attempt to sketch briefly the development of the « reality » of the labor force and of its « interpretative », descriptive concept — the occupational classification. In the second part, the analytical and policy tools of economics will be introduced.*

## Introduction

I think that in discussing the occupational classification of the labor force, it is extremely important to keep the past, on the one hand, distinct from the present and the future, on the other. Such a distinction, it seems to me, reveals a critical state of mind, which may or may not lead to constructive and positive criticism. To be constructive one must be evolutionary, and show, for example, that the 1961 *Census of Canada* Occupational Classification was superior to that of the 1951 *Census*, and that this, in turn, was superior to that of the 1941 *Census*, and so on down the line. Such a comparison, however, we all know, would not be a fair comparison because the thing measured, the quantity and the quality of the labor force in Canada at the time of census taking, changed. In this instance, a fairer comparison would be the one which appraises in terms of the appropriateness, at the time of the census taking, of the occupational classification in measuring the properties of the labor force it purports to measure. The more isomorphic is the occupational classification of the labor force to the actual labor force in the field, in Canada, the « better », one may say, is the occupational classification in describing the labor force at the time of census taking.

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\* The views expressed in the paper are those of the author. They do not necessarily express those of other persons or institutions.

Let us note that when we talk about the occupational classification as we do, we conceive it as a tool descriptive of the labor force; and, that apart from « reality » — which is the actual quantity of the labor force and its quantified characteristics — we have but one « interpretative » concept, that of the Occupational Classification.

In the first part of this paper, I shall attempt to sketch briefly the development of the « reality » of the labor force and of its « interpretative », descriptive concept — the Occupational Classification. The Occupational Classification scale, of course, is the changing yardstick. The conclusion of such a survey is obvious: the extent of isomorphism between the « reality » of the labor force and its yardstick has been shrinking.

In the second part of the paper, the analytical and policy tools of economics — as opposed to the descriptive devices — will be introduced, and it will be pointed out that a part of the present dissatisfaction among the working economists — as opposed to the data collectors — is due to the fact that their analytical machinery cannot take a grip on the slippery surface of the present menu of the occupation scales. In the second part, I shall also argue that a multipurpose occupational classification scale must take into account the analytical and policy instruments of economics.

### **The Descriptive Devices**

Knowledge of the history of census taking in Canada is not a luxury but is one of the best ways of appreciating the most recent census. The census, as we know it, is primarily a social document. Its originators thought that it contributed to the process of governing of the country. Such characteristics would suggest that custom and tradition — at home and in the mother country — weighed heavily in the minds of the census takers. From decade to decade, therefore, censuses developed slowly. One census not only resembled the following but, in fact, laid many of the principles for the guidance of the future census takers.

Following the period of nation building characterized by the economics of the mercantilists in Europe, the main paths of economic interaction were specified, and governments settled down to the business of governing people rather than their economic affairs. In the age of

growing belief in the powers of reason — and, in England, of so-called common sense — it was assumed that « figures speak for themselves ». Early Censuses were, therefore, simple, and their job was to describe a simple reality.

Early economic life in New France was simple. The first recorded population census was taken in 1665 by the « intendants » from France.<sup>1</sup> In the period of colonization, settlement, and conquest of the country, the main interest — from the point of view of the European core — lay in the growth of the population on the periphery. Censuses from about 1660 to 1750 gave population by sex. Recognition was given to age — the source of potential population growth — by dividing the population into « people » and « children ».

*The Census of New France, 1665-1666* gave a table of « Professions and Trades ».<sup>2</sup> These were listed almost alphabetically. For example:

Armorsers  
Gunsmiths  
Gentlemen of Means  
Servants  
Sword Grinders  
Bailiffs

Thus, it was the French Census taker who started the whole business of occupational classification in Canada, before the advent of « industry », and the need for industrial classification.

In the English speaking part of what is now Canada, the interest extended into a different direction — that of the origins or the sources of the people. No mention is made in *Census of Newfoundland, (1691)* of industrial or occupational distributions.<sup>3</sup> *Census of Canada, (1765)* classified people by sex, and into married and widowed groups.<sup>4</sup> In addition to these, the *Census of Nova Scotia, (1767)* introduced the

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(1) *Census of Canada, 1870-71*, Vol. 4, Ottawa, 1876, contains the summaries of 98 Pre-Confederation Censuses in and for the territories then constituting the British North American Provinces.

(2) *Ibid.*, pp. 3 and 4.

(3) *Ibid.*, p. 25.

(4) *Ibid.*, Table I, pp. 64-5.

questions on « origins » and religions.<sup>5</sup> But it was in the *Census of Nova Scotia*, (1827) that occupations by sex were first given in two groups:

Various occupations  
Labourers and servants<sup>6</sup>

By that time, *Census of Lower Canada*, (1827) for the already formed cities of Montréal, Trois-Rivières, Québec, and Gaspé, listed the industries and the occupations in two separate tables.<sup>7</sup> It was recognized that the two were not the same thing, and that the divergence between the two was caused by the growth of cities and industry, and by division of labour. In the following, we shall see that the problem of divergence — as I shall call it — between the industrial and occupational classification was to harrass the census takers for 150 years, particularly those who followed the English school of census taking. The question mark of the « problem » was simply the inability of the census readers to compehend that the boundaries of an industry could extend beyond the boundaries of the roughly corresponding occupational category. For, in the rural setting, the census readers were accustomed to identifying an occupation with the industry which seemed to correspond to it. Fishing, for them, was more than an occupation or an industry. It was a most exemplary way of life; it was the imagined norm, the prototype of a segment of the economy in which the occupational and the industrial boundaries coincided. Thus, their accustomed eyes did not see the nascent forces of industrialization with their consequent train of new products, produced in different ways, calling for the employment of appropriate labour inputs, whatever these may have been.

The *Census of Lower Canada*, 1827 signifies another mile-stone in census taking in Canada, if we wish to think in such terms.<sup>8</sup> By looking at its occupational classification, it is possible at least to infer the principle of classification. It appears to have been that of « trade and place of work », but it is impossible to say which of the two bore a

(5) *Ibid.*, Tables I and II, p. 70.

(6) *Ibid.*, Table I, p. 94.

(7) *Ibid.*, Tables IV and V; « Industries » and « Occupations », p. 97. « Occupations » were: Justice of Peace; Physicians; Notaries; Artisans; Shopkeepers; Innkeepers.

(8) *Ibid.*

heavier weight. The next three or four Censuses of Quebec, however, were quite unsystematic, uneven, or irregular in the description of the labour force from the occupational point of view, although on the whole they were more detailed and « occupational » than those of Ontario. A part of this erraticism — which results in the inability, for example, to establish trends in occupations — was undoubtedly, I surmise, due to the desire on the part of Quebec to accept the Ontario classification while retaining her previous detailed categories.

The mid-19th Century pre-Confederation Ontario Censuses are, in a sense, the parents of the present Censuses of Canada. It is well to recall that the French censuses were characterized by detail, and by interest in the description of the labour force in which the occupational and the industrial distributions were kept clear, and in which the information on the industrial distribution was collected from the cities: the foci of industry. On the other hand, the English-influenced censuses of Ontario, Nova Scotia, and so on, conceived of things in more global terms — perhaps because of the obvious need to report briefly to the mother country — and emphasized the origins of the population rather than the direction or the channels along which it distributed itself over the face of Canada.

Thus, the *Census of Upper Canada, (1842)* distributed the « occupations in cities » into:

Commercial  
Farm males  
Servants, male and female  
Coloured race<sup>9</sup>

and this format was reproduced in the *Census of Lower Canada, (1844)*.<sup>10</sup> Ten years later, in the *Census of Upper Canada, (1851-52)*, the occupations were surveyed by counties, according to the following groups:

Agriculture class  
Commercial class  
Domestic class

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(9) *Ibid.*, Table VI, p. 137, and Table XI, p. 140.

(10) *Ibid.*, p. 153.

Industrial class  
Professional class  
Not classified.<sup>11</sup>

From that point to the first *Census of Canada, 1870-71*, no changes were made in the description of the labour force.<sup>12</sup> The six classes were to remain in the census explicitly for forty years, and implicitly to the present day. The 1870-71 census was a blend of the French and the English approaches. It « contains the enumeration of the people by occupations, being a general exposé of the various industries in which the population is engaged ».<sup>13</sup> The numbers of people involved are grouped under occupational titles listed alphabetically as follows:

Accountants  
Advocates  
Agents  
Farmers  
Fishermen.

When it came to the « recapitulation », the occupations were laid out in the already familiar English pattern:

Agriculture class  
Commercial class  
Domestic class  
Industrial class  
Professional class  
Not classified.<sup>14</sup>

For the first time, the worry of the census takers of the English school, regarding the discrepancy between the industrial and the occupational classifications, was expressed:

Thus, it appears by Table XII : *Occupations of the People*, that there are 18,362 fishermen by profession, and by Table XXVI : *Fisheries*, that nearly 40,000 individuals contribute to the fisheries or to work

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(11) *Ibid.*, p. 193.

(12) That is, *Census of Lower Canada, 1851-52*; *Census of Upper Canada, 1860-61*; and *Census of Lower Canada, 1860-61*; in *Census of Canada, 1870-71*, Vol. 4, pp. 217, 218, 268, 270-1, 308-9, and 312-17.

(13) *Census of Canada, 1870-71*, Vol. 2, Ottawa, 1873, p. vi.

(14) *Ibid.*, Table XIII, p. 261.

connected with them. The *excess* includes the number of persons who, without being a fisherman by profession, have yet brought a certain amount of labour to the business of catching and preparing fish during the year of 1870.<sup>15</sup>

The « bulging » industries, thus, spilled themselves over the previously designed occupational constraints. For the next sixty years, as we shall see, the census takers did not realize that the actual labour force had two distinct aspects; and they attempted to define « industry » in terms of occupational titles, with the progressively increasing loss in the descriptive ability of the costly census data.

The emphasis of the census taker — in the descriptive days of demography and economics — was on the listing of the numbers, so it seems, under appropriate titles. His principles of classification have to be inferred from the titles which he gave to occupational groups and from the general context. The thus inferred principle of occupational classification of the employed, listed in the *Census of Canada, 1870-71*, seems to be that of the extent to which an individual contributed to production in his major occupation.<sup>16</sup>

The decade between this first census and the *Census of Canada, 1880-81*, was one of rapid industrial growth in Canada, and the census takers in 1880 had to reinforce the leash to keep the galloping boundary of the industrial-occupational matrix from dispersing. This census, like the previous one, was insistent that there *ought to be convergence*, in principle, of the occupational and the industrial classifications. The difficulty of fitting the obsolete principle was doubled by the idea that the industrial classification was only a supplementary one, and that the occupational distribution of the people gave the first and the main part of the picture of the « reality » of the labour force:

*Detail, in reference to the employment of the people are [sic] further supplemented in the third volume of this work under « Industrial Establishments », but it must be remembered that there cannot be any precise agreement between the two statements, they having reference to two states of fact, the one giving the number of hands employed at the several industries, it may be a week, a month or a year ; the*

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(15) *Ibid.*, Vol. 3, Ottawa, 1875, p. x.

(16) Cf. Vol. II, Table XIII, « Occupations of the People », pp. 250-345.



other giving that occupation to which the person devotes the principle part of his trade.<sup>17</sup>

Difficulties which are experienced on the level of principle usually call for their repeated statements. In this instance, for the first time, the principle of *occupational classification of people* appeared:

Persons engaged in more than one occupation are assigned to that which *they appeared to attach the most importance*, or to that which *they happened to be following at the taking of the Census...*<sup>18</sup>

The following *Census of Canada, 1890-91*, just grimly commented on the topic:

A very considerable discrepancy exists with respect to boys under the heading « Industrial Establishments » and under heading « Occupation ». In this first case they are given with the other hands in the Industrial Establishments, and in the second instance they are returned as going to school, which is their chief occupation.

*These divergencies appear to be unavoidable.*

The general rule followed has been that provided by the directors of the Census of England.<sup>19</sup>

However, looking over the tables of the « Occupations of the People », I think it is fair to say that this was the « best » of the censuses in the last century in Canada, and that we had to wait for some 30 years, or more, before we came to another census which equally suitably and appropriately *described* the reality of the labour force by *describing* the characteristics of the employed people. The labour force was catalogued into the six established divisions or classes, and then was broken further into some 240 occupational groups, designated by titles but underfined.<sup>20</sup>

(17) *Census of Canada, 1880-1881*, Vol. II, Ottawa, 1884, p. vi. My italics. The phrases « precise agreement » and « two states of fact » at the same time suggest a contradiction and an awareness of a distinction.

(18) *Ibid.*, my italics. At this stage it may be interesting to note the layout of the *Census of Canada, 1880-81*, for it was followed implicitly in all the others, although its pattern may now appear to be lost. The layout, of course, is indicative of the order of importance the data collectors attached to their data. It is as follows: Vol. I — Population; Births, Age; Vol. II — Age, Deaths, Occupations; Vol. III — Property, Industries; Vol. IV — General Report on the Census.

(19) *Census of Canada, 1890-91*, Vol. II, Ottawa, 1893, p. vii, my italics.

(20) *Ibid.*, Table XII, pp. 140-91, « Occupations of the People ». The Sixth Division was changed, however. « Non-productive » contains Indian Chiefs, members of religious orders, paupers, retired students, and is, of course, a reflection of J.S. Mill's distinction between the productive and unproductive. In the words of the Census: « The occupations are divided into six classes, arranged according to their natural order of precedence... the sixth class embraces those engaged in occupations not productive ». See page i.

I do not know what went "wrong" in the making and the presentation, as well as the Introduction, of the *Fourth Census of Canada, 1901*.<sup>21</sup> I did not find it worthwhile to decipher, although I did come to the conclusion that it, and some of the volumes of *Hansard* are fruitful topics for a doctoral dissertation in history.

With the *Fifth Census of Canada, 1911*, however, we enter a new era in the amount of attention paid to the occupational classification of the employed in the labour force. It gave its sixth volume, 469 pages thick, and also a separate supplement, *Index to Occupations*, 230 pages long, to « Occupations of the People ». The « Index » marks, we should say, the beginning of « true » occupational classification.<sup>22</sup> Without doubt, however, the 1911 Census was the « worst » of all, if it be judged in terms of achieving its purported intent of describing as much as possible of the total reality of the labour force. Principles of classification — i.e., the aims and the objectives of work — were neglected, and went unstated. All of the effort went into making the convergence of the occupational and industrial classifications total.<sup>23</sup> And what had been only classificatory principles to the previous census takers became devices for achieving total isomorphism between the two classificatory scales.

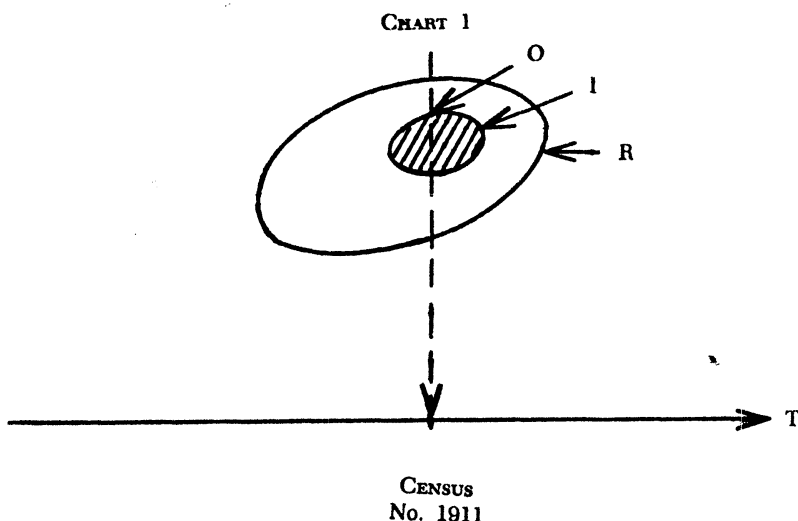
This point can best be illustrated as follows: On *Chart 1*, for the Census year 1911, the total reality of the labour force — which cannot be absolutely measured — is the total area R. R is measured or « indexed » by means of the census of occupations (O) and by means of the census of industries (I), also representable by areas. To the extent that O and I coincide perfectly, the information regarding R is duplicated. Put alternatively, had O and I not coincided on the area of R, it seems that more information, at the same cost, would have been produced.

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(21) *Fourth Census of Canada, 1901*, Vol. I, Ottawa, 1902, « Population » ; Vol. II, Ottawa, 1904, « Natural Products » ; Vol. III, Ottawa, 1905, « Manufacturers » ; Vol. IV, Ottawa, 1906, « Vital Statistics ».

(22) *Fifth Census of Canada, 1911*, Vol. IV, Ottawa, 1915, and *Index to Occupations, 1911*, Ottawa, 1911. I think it can be debated, however, whether or not it was indeed a « true » occupational classification of the labour force.

(23) The Table of Contents of the *Fifth Census of Canada, 1911*, Vol. VI, Ottawa, 1915, p. xxx, has a deceptive title — « Labourers, Method of Classification at each Census 1881 — 1911 ». It whets the appetite for a chronological table of principles of occupational classification, but it does not feed it.



To achieve the desired coincidence between O and I, however, the following rules were set, applicable to the employed only:

The enumerators were instructed that an entry should be made for the « chief occupation or trade » of any person of ten years of age and over — if employed at gainful labour, by the word which designated most clearly the class or kind of work by which the individual earned a living... <sup>24</sup>

and;

*Instructions to Occupation Editors.* The first part of the symbol has reference to the particular *industry* or place where the worker is employed as shown in column 22 of the population schedule. The second and third parts of the symbol indicate, respectively, the class or rank of the worker and his trade or calling as entered in column 17 of the schedule. <sup>25</sup>

In other words, each industry definition had a list of occupations which comprised it, and which also defined the boundaries of the industry. The problem of defining industry, or occupations, in terms of goods produced or of services performed did not arise.

(24) *Ibid.*, p. ix.

(25) *Fifth Census of Canada, 1911 ; Index to Occupations*, Ottawa, 1911, p. 1.

So that there would be no mismatch between industrial and occupational distributions of the labour force, Mr. E.S. Macphail, Superintendent of Compilations, added:

When an occupation appears on the schedule for which no symbol has been provided in the « Index to Occupations » the omission should be at once reported that the proper symbol may be supplied and the necessary amendment made in the Index.<sup>26</sup>

This cross-classificatory, dictionary-like device, providing for 100 per cent consistency between the occupational and industrial censuses, was stretched further in the *Alphabetical Index to Occupations, Sixth Census, 1921*, in which, for each occupation, the appropriate industry slot was specified, for a total of over 385 pages. This was called « the correlation of occupations of the people to the industrial framework ».<sup>27</sup>

I think that the record, or the story, of these turn of the century censuses is more than a historical surd. For it shows how people attempted to cope with « evolution in processes of production ».<sup>28</sup> And it also indicates, just as the stories told about Adam Smith's neglect of the signs of the origins of the Industrial Revolution, that the census machine is a slow moving machine which adjusts to the changed reality of the labour force with about a 30 year lag. Some of the indices of the inappropriateness of the occupational classification to cope with the reality of the labour force, in my opinion, were:

- 1) Lack of a stated purpose, other than that of doing the job assigned by the B.N.A. Act, for the collection of information.<sup>29</sup>
- 2) Bulkiness of the classification.
- 3) The dependence of one classification on another, leading to the absence of a need to define principles, purpose, and concepts involved, and to circularity of presentation of the dictionary type.

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(26) *Ibid.*

(27) *Alphabetical Index to Occupations; Sixth Census, 1921*, Ottawa, 1921, p. 4.

(28) *Sixth Census of Canada, 1921*, Vol. IV, « Occupations », Ottawa, 1929, p. viii.

(29) The British North America Act of 1867 (30 Victoria, Chapter 3), Section 8, states: « In the general census of the population which is hereby required to be taken in the year one thousand eight hundred and seventy-one and in every tenth year thereafter, the respective populations of the four Provinces shall be distinguished ».

Following 1921, however, the industrial classification gained full independence from the occupational classification. Henceforth, it was based instead on the new commodity classification. Its stated purpose, however, was — and it is revealing of *the coverage* or applicability of the occupational classification — « to differentiate the gainfully employed into ten main industrial divisions ». <sup>30</sup>

It was in the preparation for the 1931 Census that the occupational classification became, so to speak, either correlated to or subsidiary to the industrial classification. The classificatory principle, of 1921, of the « chief occupation or trade », for the employed, and the « occupation followed by the person *when* employed », for the unemployed, was affected, on the one hand, by the new concept of the « gainfully employed », and, on the other, by the « type of commodity produced » concept of the new industrial classification. The result was a hybrid principle of occupational classification.

A gainful occupation was defined as one by which « the person who pursues it earns money or in which he assists in production or marketable goods ». <sup>31</sup>

And it produced an occupational classification with an industrial flavour in the 1931 <sup>32</sup> and 1941 <sup>33</sup> censuses, a taste of which, in my opinion, still lingers strongly in the *1961 Census of Canada*.

The principle of classification of occupations used in the following Inter-War Censuses was simplified in the 1951 Census <sup>34</sup> and 1961 Census, <sup>35</sup> by deleting the « earning of livelihood » clause. The 1951 Census also emphasized — but only meekly — the output aspect of the individual, i.e., « the kind of work performed or service rendered ». <sup>36</sup>

But one may note the beginnings of another divergence in the occupational classification, which, as we know, is the most prolific source of divergences for interpreting the reality of the labour force.

(30) *Alphabetical Index to Occupations ; Sixth Census, 1921, op. cit.*

(31) *Seventh Census of Canada*, Vol. I, Ottawa, 1936, Chapter VII, « Occupations and Industries », p. 276.

(32) *Ibid.*, Vol. III, Ottawa, 1936, p. 1007.

(33) *Eighth Census of Canada, 1941*, Vol. VII, Ottawa, 1946, p. 1138.

(34) *Ninth Census of Canada, 1951*, Vol. IV, Ottawa, 1953.

(35) *Census of Canada, 1961*, Vol. III, Ottawa, 1963, Part II.

(36) *Classification of Occupations ; Ninth Census of Canada, 1951* was, of course, based on the new concept of the « labour force » which, from the point of view of the classifications, is not too different from that of the « gainfully employed ».

This basic concept (of the « kind of work performed or service rendered ») does permit the organization of occupation titles into an occupational structure in any one of several ways, depending upon the criteria or *primary basis adopted* for classifying or grouping occupational titles into occupational classes. This problem arises chiefly from the fact that job terminology is the resultant of such elements as the academic, vocational, apprenticeship, or specialized training, type of machine operated, experience necessary, degree of skill required, material worked on, conditions of work, etc. The resulting classification, therefore, depends upon the element or combination of elements to which chief consideration is given. In addition, the final product may be designated so as to reflect a socio-economic, a quasi-industrial, level of skill, etc., aspect.<sup>37</sup>

(In short, because of a lack of forethought, the occupational structure was made to be flexible and adaptable — or multipurpose — and like the sun and Belinda it « shone on all alike ».)

The similarities between the 1911 Census and that of 1951 are striking:

- 1) The expanding reality of the labour force was detected in the classification dealing with the occupational traits or characteristics of the labour force.
- 2) The new trait — or new dimension — was not identified. In 1911, and subsequently, it became identified, sequentially, as industry in the cities, industry in industrialized counties, etc.
- 3) In both cases, it was thought that, without the need to create an independent and independently defined new system of classification, the occupational structure was flexible enough to capture new traits, while preserving its traditional elements.

The development in the design of the occupational classification between 1951 and 1961, unlike that in the previous half of the century, turned away from the principles of classification to the investigation of the structure, or the layout of the system. For this, the *International Standard Classification*, based, like the 1951 and 1961 censuses, on the « basis of work performed », was helpful.<sup>38</sup> Indeed, this Classification

(37) « Classification of Occupations, 1951, Census », a paper contributed by Canada at the British Commonwealth Statisticians' Conference, London, September 4, 1951.

(38) International Labour Organization, *International Standard Classification of Occupations*, Geneva, 1958.

influenced greatly both the 1961 Census and the development of future censuses.

The origins of I.S.C.O. lie in the Europe of the late 1940's, a Europe characterized by the economics of reconstruction, labour scarcity, low capital-labour ratio, and significant language barriers. The United Nations, the O.E.C.D., the United States (armed with the D.O.T., the *Dictionary of Occupational Terms*, which defined some 25,000 occupations), and I.L.O. produced I.S.C.O., whose principle of classification was the « kind of work performed », and whose optimistic purpose was to act as an aid in the mobility programs regarding people.<sup>39</sup> I.S.C.O., present and prospective, compared to the *1961 Census of Canada*, may be characterized as follows:

- 1) It has a shorter list of occupations.
- 2) The occupations are defined from several points of view of the word « work ».
- 3) About 90 countries or international organizations influenced I.S.C.O. by suggesting the appropriate or the « real » occupations which they have observed.

I.S.C.O., its makers think, is a truly multipurpose international classification. Its two main mutually dependent purposes are, one, to act as an aid in making international reports and comparisons dealing with economic and social data or phenomena, and, two, to help as an aid in the conduct of manpower development policy by using a multi-factor determined definition of « work performed ».

The first characteristic of I.S.C.O. — that of translatability — is perhaps of utmost importance. Its usefulness is exemplified in the work of Herbert S. Parnes, of Ohio State University, for the Mediterranean Regional Project conducted by the O.E.C.D.. The essence of the multipurpose character of the occupational classification lies, perhaps, precisely in this « translatability » characteristic.

At this stage, it may be useful to recall the suggestions, in the 1951 Census of Canada, regarding the rise of divergences, each of which could possibly have qualified as a dimension for defining the « work

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(39) At present, revisions of the 1958 I.S.C.O. are taking place. See I.L.O. WG/ISCO. 65/2, Part I.

performed » criterion of occupational classification.<sup>40</sup> Some of the dimensions which are thought to be used to define the aspect of « work » or « job » performed are:

- specific tasks or functions performed;
- the purpose for which the work is done;
- the materials, tools, and equipment used;
- the standard to be met by working environment;
- the education and training needed by a worker to perform a job.

The existence of several dimensions — for which there is no constant in applicability — makes the definition of this aspect of the reality of the labour force difficult, if not impossible. The experience of the Canadian censuses — with regard to the birth of the industrial classification from the occupational classification, and its subsequent independent status — shows one way of resolving the difficulty. Another kind is provided by Parnes' work.<sup>41</sup> It may be convenient to call this kind of an approach the « Distilling Technique », because it attempts to distill or refine — from the I.S.C.O. multi-factor determined definition of « kind of work performed » by occupation — the « skill level » required for the performance in the present or prospective jobs. It is to be distinguished from the « Direct Approach » which would set up an independent classification of the labor force on the basis of a new criterion, for example, the median level of education of the occupational group, by ranking the occupational titles from high to low, with regard to the value of the average attached to them.

The Parnes' approach provides a clear and an unadulterated picture of the inherent qualities of a man, in broad strokes, and emphasizes equally his present as well as his future, i.e., the retrainable or the retrainability potential. It proceeds by dividing the labour force into four groups, with the following lower boundaries of the educational-training content:

*Class A:* All occupations for which a university education... is required.

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(40) *Ibid.*, p. 4. These, and other factors, are taken into account in determining the type of work performed.

(41) H.S. PARNES, *Forecasting Educational Needs for Economic and Social Development*, O.E.C.D., Paris, 1962.



*Class B*: Occupations for which two or three years of education beyond the secondary level... are required.

*Class C*: Occupations for which a secondary school education... is required.

*Class D*: All other occupations.<sup>42</sup>

With the aid of this code, Mr. Parnes rearranged the structure or the format of the I.S.C.O. The depiction of the labour force in terms of categories of A to D suggests the « skill content » of *the employed and of the unemployed*, the present or prospective employability of these people, the amount of capital inherent in them — if one wishes to view it as such — as well as their training potential.

Thus, to this century, we brought the occupational classification of the labour force, and added to it industrial and skill classifications. On the whole, we tended to develop classifications which were independent from one another, and their interdependence seems to lie largely in their origins.

The development of these classifications was largely guided by the desire to describe. Since the war, the forecasting and the policy motives produced Parnes' classification. But, on the whole, the policy directives which motivated the creation of this classification were broad and inconclusive. The resulting classification of Parnes lacks conclusiveness, both in its fundamentals and with regard to its uses.

My conclusion is that it is possible for policy to be specified, in terms of aims, instruments and measures, so that the *appropriate* occupational classification scale can be inferred, or translated, from the policy criteria.

### **The Analytical and Policy Tools of Economics**

In the previous section, enough was indicated about the relationship among the various occupational scales we have on the menu. Broadly speaking, the three scales have « translatability ». But it must be noted that this « translatability » is the product of the historical development of these scales. For each one of the scales made its appearance to meet the needs of a new Census. The birth of the underlying principles

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(42) *Ibid.*, p. 26.

of classification, however, was subsequent to the use to which these scales were to be put. Thus, no « preview » or « anticipatory » element was built into the scales, with the possible exception of Parnes' schema. And, again, it may be argued here that his schema is not an independent one; for, borrowing as it does from the older schemas, it borrows the bad with the good.

Various writers feel that these schemas are archaic.<sup>43</sup> The emphases in such arguments have been placed on the lack of perfect « translatability » of each one of the three scales into another. The stress on total « translatability » of one classification into another is more than a complaint. For example:

*One*, the 1961 Census' occupation divisions have been given on an I.S.C.O. basis, but no finer breakdowns are available. In fact, the three-digit occupational code groups contain so many occupations that a direct translation of these to the I.S.C.O. — for projects which deal with larger than plant aggregates — is not only a big job, but almost impossible in principle.

*Two*, looking at I.S.C.O. itself, in terms of the alternative approach to occupational classification by educational achievement, I get the impression that I.S.C.O. is not too readily translatable to the classification based on criteria other than those of « type of work performed ». The « type of work » criterion is carried over into Parnes' Class B Workers in Transport and Communication, lock, stock and barrel.

People have complained for some time about the lack of another — analytical — translatability. In considering the performance of the labour force in the market place in Canada, it is noteworthy that labour itself is less and less important in the productive processes in Canada today. It is its cooperative aspect which is consequential: its acquired skills which complement the machinery and buildings in which the output is made. In measuring the performance of labour, both (a) inherent qualities (Column 2 of Chart II), and (b) environment (Column 3) need to be known. In short, I am suggesting that we cannot now translate Columns 1 to 4 into one another, and that such a translation chart would be a useful tool in reaching for the « potential output » of the Economic Council.

(43) For example, JAMES SCOVILLE, « The Development and Relevance of U.S. Occupational Data », *Industrial and Labour Relations Review*, Vol. 19, No. 1, October 1965, pp. 70-9.

CHART II :  
VARIABLE TO VARIABLE, OR AN ANALYTICAL OR FORECASTING TRANSLATIONS CHART  
(COLUMNS)

1961 census classification of occupations	(1)
Quantitative indexes of the educational content of the labour force	(2)
Actual output per man	(3)
Potential output per man, based on  a) Col. 2 data b) A denison-like index of productivity per man by occupation by impact on increases in G.N.P. c) His « employability », i.e., how well he works with machines of the right kind and which is measured by capital-labour ratio, or export content of value added per man d) His « retrainability »	(4)

A four factor weighted index occupational scale would take us some way into the area of forecasting. As an analytical device, such a classification would be useful. For purposes of policy, however, it would, I think, prove too cumbersome, complex, and insufficiently near to reality, to be convincing as a criterion on the basis of which successive rounds of policy could be based. The effects of policy on data so collected would also be difficult to evaluate.

It may be desirable to recapitulate that which has been said so far, and the implications thereof. So let us turn some of these things to their various sides, and state, on the level of principles, the issues involved in the construction of a multipurpose occupational classification, and to formulate its specific purposes and objectives. To sum up the present situation:

- 1) In census taking, there is a tendency to make its framework suitable not only for descriptive uses, but also for the jobs of analysis and forecasting.
- 2) From other areas of data gathering, we can say, in terms of Chart III, that in recent years the interest has tended to aid the development of analytical, forecasting, or policy data, and that the descriptive aspect of data is on the wane.
- 3) The direction of policy has changed; economic policy has broadened and become co-ordinated with the social.<sup>44</sup> Education as an economic variable has made its appearance.

CHART III : THE DATA

Level on which they appear	Administrative or operational	Descriptive and/or analytical	Forecasting and/or policy
Micro			
Macro			

(44) United Nations, *Report on the World Social Situation*, New York, 1961.

These shifts in the emphasis of policy, without the corresponding shifts in the direct measuring devices, may make the policy action, with regard to the new variables, less than definitive and less than decisive. The technique of adoption on the part of data makers — to the demands of social and economic strategy — seems to have been that of adopting of the old classification to new needs, by rearrangement or by distillation. And now, with the emphasis put on the « wealth of individuals », one enters a kind of Nurske's circle, in which one may tend to reason from equity of an individual, to his consumption income, to his potential output.

Borrowing from the terminology of Public Finance — before it turned to the Economics of Welfare for help — it is possible to isolate one part of the « goals » complex, that which refers to consumption income.<sup>45</sup> Chart IV suggests that, on the output side of the economic performance of the individual, which is measured by his total consumption income (i.e., « family income » in the case of the N.E.S. areas, where  $n = 208$ ), his actual earning ability is distributed normally, and is different from the norm. Perhaps the « goal » of policy is both to flatten out the curve and to raise the norm, for the seven million actually employed and the one-fourth million unemployed individuals in Canada.

CHART IV

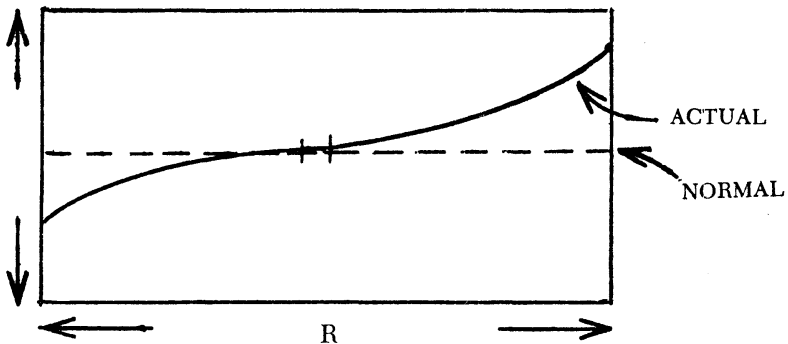


Chart IV, however, assumes that the actual output produced is the result of a standard effort which is constant and unchanging. The aim of full employment policy is, of course, to alter and affect inputs

(45) J.A. MAXWELL, *Fiscal Policy, its Techniques and Institutions*, New York, 1955, p. 137.

so that the effective standard effort, and, therefore, output, are increased.

## Conclusion

In thinking about the occupational classification scale which we shall be using until 1982, some thought needs to be given to the possible menu of policies which will be pursued in 1970, and to the adequacy of the measured variables in the making and the evaluation of these policies.

The decade that lies ahead, we must assume (so as to err on the pessimistic side), will require a greater effort and a bigger arsenal from the policy-maker, and will be characterized by both an industrial and a scientific or occupational revolution. The problem of adjustment of labour to capital will perhaps again assume the proportion it held from 1760 to 1830.<sup>46</sup> General policies, monetary and fiscal, on the whole, will be expansionary. Relatively lower rates of interest, bigger balanced budgets or surpluses, and increases in « technology » will result in interest — induced — investment, consumption — accelerated — investment, and technology — induced — investment, respectively. The sum total of investment will perhaps increase from about 20 per cent of G.N.P. to 25 per cent. In Rostowian terms, this is tantamount to a take-off.

Assuming a constant (investment) / (construction worker) ratio, this will lead to a direct increase in demand for construction workers, which, in all likelihood, will be supplied or, perhaps, oversupplied. With the prevalence of a low unemployment rate, labour shortages may appear in the manufacturing sector. This as well as the following factors may tend to increase the « employability » of capital more than that of labour:

- 1) Incorporation of technology into capital;
- 2) Emphasis in inventive interest on the creation of labour-substitute machinery, tending to increase the capital for labour elasticity of substitution;

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(46) See T.S. ASHTON, *The Industrial Revolution, 1760-1830*, Chapter 2, « Capital and Labour », London, 1948. But also recall that the three volume book by K. MARX was entitled *Capital*.

- 3) Constancy in capital-output ratio within the format of the triangular production function, suggesting that shifts are taking place between shares of capital and of labour;
- 4) A general trend in the Canadian as well as in the United States' economy towards higher elasticity of substitution of capital for labour, in the industries.

Therefore, in devising the occupational classification scale for the 1971 census, I think that some weight need be given to the « complementarity », with the capital aspect, of the labour input, expressed perhaps, by an index to the « on-the-job-retrainability »

## NOTES SUR LA CLASSIFICATION OCCUPATIONNELLE

Le but de ces « Notes » est de tracer le développement de la réalité de la main-d'oeuvre ainsi que cette description « interprétative » — classification occupationnelle — en examinant les grandes lignes de l'histoire du recensement au Canada.

Pendant les trois cents années de recensement il y a eu des tentatives de recueillir des données sous une forme significative commençant avec la « classification occupationnelle française » et avec les classifications anglaises selon l'origine nationale. Pourtant en 1827 les recenseurs se sont rendus compte qu'une distinction utile pouvait être faite entre les classifications industrielles et occupationnelles, mais au tout début du siècle présent l'accent a été placé de sorte qu'on a abouti à l'isomorphisme total des deux classifications. Ceci a conduit à une diminution du pouvoir descriptif parce que les recenseurs ne se sont pas bien rendus compte que leur main-d'oeuvre actuelle présentait deux aspects différents. Malgré l'introduction de nouveaux principes de classification dans le recensement de 1921 et 1931 la réalité grandissante de la main-d'oeuvre, ces nouvelles caractéristiques aux dimensions n'étaient pas saisies d'une façon adéquate par la structure de la classification occupationnelle. L'introduction de la « Classification Internationale Type des Professions » qui était basée sur le concept de la « nature du travail effectué » entre 1951 et 1961 donnait un autre critère pour définir un aspect de la réalité de la main-d'oeuvre. Seulement elle a conduit à une série de classifications — occupationnelles, industrielles et selon les habiletés — qui étaient largement indépendantes et ne pouvaient être traduites.

Ainsi jusqu'à ce jour il y a eu des tentatives pour développer une structure qui rendrait le recensement apte à des usages descriptifs aussi bien qu'à l'analyse et les projections, mais l'accent sur l'aspect descriptif a graduellement diminué.

Comme la politique économique a été plus coordonnée avec la politique sociale durant les années récentes il y a une nécessité croissante d'ajuster les classifications anciennes aux conditions nouvelles. La structure des classifications futures devra être reliée à l'éventail des politiques possibles de sorte que les variables économiques requises répondront aux exigences. Il est également important de considérer les complémentarités des « inputs » du travail et du capital. Peut-être un indice de « recyclage » sur le temps » (on-the-job-retrainability) est utilisé en combinaison avec l'approche de Parnes consistant à définir « le travail effectué » en classifiant les travailleurs en des catégories qui suggèrent le « contenu d'habiletés » et plus appropriées pour une mesure des caractéristiques importantes de la main-d'oeuvre.

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